

PATENT ABSTRACTS OF JAPAN

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(71)Applicant : **MEIJI MILK PROD CO LTD**

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(54) CREAM CHEESE-LIKE FOOD AND ITS PRODUCTION

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain the subject cream cheese-like food having excellent flavor and texture without off-flavor by adding an acidic raw material to a specific milk protein-highly containing powder, animal oil and fat and/or vegetable oil and fat and a melting salt, heating and melting, and adjusting pH of the product after cooling.

SOLUTION: This cream cheese-like food is obtained by using (A) milk protein-highly containing powder derived from skimmed milk concentrated in a process containing a ultrafiltration concentration and finally spray drying without varying more than 1 of pH by an acid and/or an alkali and having a slight lactose content as a main raw material, (B) animal oil and fat and/or vegetable oil and fat, and (C) a melting salt (e.g. monophosphate) and adding (D) an acidic raw material (preferably yogurt) to adjust pH of the product after heating, melting and cooling to ≤ 5.2 . Preferably, the addition of the component D is performed after blending and dissolving the raw materials other than the component D and emulsifying fat. Preferably, the component A contains $\leq 10\%$ of lactose and $\geq 70\%$ of milk, protein.

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CLAIMS**[Claim(s)]**

[Claim 1]At a process of including ultrafiltration concentration (UF concentration), condense skim milk and by a manufacturing process. . Carry out spray drying eventually without changing pH 1.0 or more with acid and/or alkali. A manufacturing method of cream cheese Mr. foodstuffs using milk protein quantity content powder with few lactose contents, animal fat and oil and/or vegetable oil and fat, and fused salt, adding and carrying out heat melting of the acid raw material, and making pH of a product after cooling or less into at least 5.2.

[Claim 2]The manufacturing method according to claim 1, wherein a milk protein content uses not less than 60% and a lactose content uses 25% or less of milk protein quantity content powder.

[Claim 3]A manufacturing method of the cream cheese Mr. foodstuffs according to claim 1 or 2 adding an acid raw material for using at least pH 5.2 or less after the mixture solution of the other raw materials is carried out and they are emulsified.

[Claim 4]A manufacturing method given in any 1 paragraph of claim 1 characterized by using lactic-acid-bacteria fermented material, organic acid, and/or inorganic acid as an acid raw material - claim 3.

[Claim 5]The manufacturing method according to claim 4, wherein lactic-acid-bacteria fermented material is yogurt.

[Claim 6]A manufacturing method given in any 1 paragraph of claim 1 using HM pectin at least as stabilizer, and uniforming after melting - claim 5.

[Claim 7]A manufacturing method given in any 1 paragraph of claim 1, wherein addition of an acid raw material for using at least pH 5.2 or less is performed so that lowering speed of pH may become quick below at a pH 0.07/second - claim 6.

[Claim 8]Cream cheese Mr. foodstuffs manufactured with a manufacturing method of a statement in any 1 paragraph of claim 1 - claim 7.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] This invention relates to the foodstuffs themselves manufactured by the method of manufacturing the cream cheese Mr. foodstuffs which were excellent in flavor and an organization without using a cheese head as the main raw material, and this method.

[0002]

[Description of the Prior Art] In the manufacture of cheese-head Mr. foodstuffs (imitation cheese heads) which is not used as the main raw material, conventionally a cheese head as a proteinic supply source, Various casein, such as various caseinate, such as sodium caseinate and calcium caseinate, acid casein, and rennet casein, soybean protein, etc. are used. Cholesterol reduction by combining cheese-head Mr. foodstuffs with a low price and vegetable oil and fat, etc. are made into a merit, and a process cheese type, a cream cheese type, a mozzarella cheese type, etc. are actually marketed. However, when various caseinate and various casein are used and gluey flavour uses soybean protein, in order that soybean flavor may carry out, Although it is carrying out odor-masking by flavors, such as a cheese-head flavor, the actual condition is that cannot finish hiding off-flavor and demand is limited.

[0003] On the other hand about imitation cream cheese, A cream cheese constituent is made from casein as a protein source or caseinate, animal-and-vegetable-oils fat, water and some stabilizer, and an emulsifier, a flavor, the method of adding acid, and the same cream cheese constituent are made, and the method of making it ferment, heating and sterilizing this and manufacturing it, etc. are exhibited. However, in the case of the former, gluey flavour of casein or caseinate origin remains, and it cannot be said as a product with good flavor. In the case of the latter, odor-masking [of the off-flavor of a protein raw material] is carried out by a fermentation process, and gluey flavour does not remain in a product. However, as for the fermentation process which starts in preparation of a starter being required although a whey partition process is skipped, it is the actual condition which cannot say easily the process simplified enough.

[0004]

[Problem(s) to be Solved by the Invention] The demand over cream cheese Mr. foodstuffs (imitation cream cheese) was especially made from the field of a low price or low cholesterol nature as mentioned above in view of the actual condition which is increasing, and this invention is ****. The purpose Various caseinate, such as **, sodium caseinate, and calcium caseinate, It is providing the good cream cheese Mr. foodstuffs (imitation cream cheese) of the flavor and organizations off flavor which are not, such as gluey flavour at the time of preparing using various casein, such as acid casein and rennet casein.

It aims at offer of the manufacturing method of the cream cheese Mr. foodstuffs which can skip required complicated processes of equipment, such as a fermentation process and a whey-off process.

[0005]

[Means for Solving the Problem] This invention was made to achieve the above objects, from every direction, as a result of examination, it was revealed with change of pH at the time of preparing them,

and gluey flavour of various caseinate and various casein noted a point further amplified by saving. [0006]If it carries out deodorization treatment with activated carbon columns etc. once using solution in using these caseinate and casein for nature content products of low protein, such as a drink, it is possible once to use it. However, like a cheese head, in a high-protein case, since it is a semisolid-like, deodorization treatment cannot be carried out.

[0007]Then, as a result of inquiring wholeheartedly from every direction, ultrafiltration technique (UF art) which has progressed in recent years is used. There are few lactose contents by including UF processing in a manufacturing process of powdered skim milk, When milk protein quantity content powder also without pH moving processing used milk protein quantity content powder which was carried out in this way and prepared as a protein raw material paying attention to a point which became producible, it discovered that outstanding cream cheese Mr. foodstuffs off flavor which are not could be prepared for the first time. Therefore, adjustment of pH in process needs to stop as much as possible for preparation of milk protein quantity content powder used in order to prepare cream cheese Mr. foodstuffs by this invention. Nevertheless, it was in process, and when changing pH 1.0 or more, gluey flavour was accepted clearly.

[0008]Even if it uses whole milk powder and powdered skim milk which obtained it by carrying out spray drying of the milk (whole milk, skim milk) directly, without performing UF concentration, good cream cheese Mr. foodstuffs are not obtained. As a result of the cause investigation, to protein, in the case of direct spray drying, there was too much milk sugar, and it acquired knowledge that good cream cheese Mr. foodstuffs are not obtained from that heterogeneous sweet taste is given to a cheese head, not emulsifying at a heat melting process, browning at a heat melting process, etc.

[0009]And the comprehensive consideration of these new knowledge is carried out, and also as a result of examination, a conclusion that powdered milk with many [lactose contents] protein contents which included UF concentration in a process and manufactured it and which has few lactose contents is preferred as a main raw material of cream cheese Mr. foodstuffs is reached, and it inquires further wholeheartedly, and results in completion of this invention.

[0010]Namely, this invention uses milk protein quantity content powder with few lactose contents as the main raw material, It is what sets to one of the important points a point of manufacturing cream cheese Mr. foodstuffs, When milk protein quantity content powder without gluey flavour mentioned above is used, Of course, a fermentation process can also skip a whey-off process, and The milk protein quantity content powder concerned, Animal-and-vegetable-oils fat, fused salt, an acid raw material, salt, a flavor, and other necessities are accepted, raw materials, such as stabilizer and an emulsifier, are mixed, heated and fused, it uniforms if needed and cream cheese Mr. foodstuffs are efficiently manufactured by being filled up.

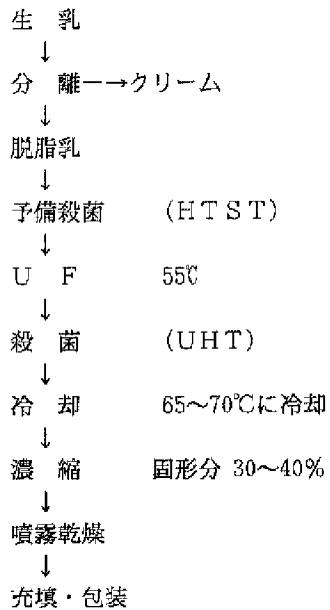
[0011]In this invention, if a lactose content is little milk protein quantity content powder with a high protein content, can use all the things, but. Especially a thing that a milk protein content manufactured without what suppressed adjustment of pH as much as possible in [not less than 70% of thing is preferably good not less than 60%, and] a manufacturing process being good, and changing pH 1.0 or more with acid or alkali is preferably preferred for a lactose content 10% or less 25% or less.

[0012]Such milk protein quantity content powder can be manufactured by a process which can condense skim milk at a process of including UF concentration, and can be manufactured by carrying out spray drying eventually, for example, is shown in the following table 1. A commercial item can also be used.

[0013]

[Table 1]

UF濃縮粉製造工程



[0014]However, the desired end of this invention cannot be attained only by using such milk protein quantity content powder. Then, it succeeded in manufacture of cream cheese Mr. foodstuffs outstanding from flavor, quality, and any field of a texture for the first time as a result of research from every direction, such as examination of additive agents, such as an acid raw material, fused salt, stabilizer, and an emulsifier, and adjustment of pH, and resulted in completion of this invention.

[0015]In this invention, an acid raw material is added and it adjusts to pH 4.0-5.2 preferably pH 5.2 or less. As an acid raw material, they are used by organic acid, inorganic acid, and/or lactic-acid-bacteria fermented material, and as an example, Lactic-acid-bacteria fermented material, such as acid, such as lactic acid, citrate, adipic acid, phosphoric acid, tartaric acid, succinic acid, phthalic acid, malic acid, phytic acid, and gluconic acid (glucono delta lactone), yogurt, cream cheese, KUWARUKU, and cottage cheese, is mentioned. In acid addition, although it will depend for a fermentation flavor on a flavor, it becomes a fermentation flavor it is more natural to add lactic-acid-bacteria fermented material. In ready-made lactic-acid-bacteria fermented material, yogurt with low pH is good.

[0016]In this invention, fused salt, stabilizer, and an emulsifier are suitably used for emulsification and texture adjustment. Although there is no restriction in particular in the kind of fused salt used in this invention, and an addition, if the conventional method of process cheese manufacture is followed, an addition, To the protein 100 in a product, 4-18 are rules of thumb, and a monophosphate, Di Linh acid chloride, polyphosphate salt, citrate, a tartrate, etc. shoot a kind, and it is independent, or is combined and is used.

[0017]As stabilizer, starch (modified starch is included), gelatin, agar, pectin, Locust bean gum, xanthan gum, guar gum, gum arabic, CMC, tragacanth gum, tamarind gum, furcellaran, ovalbumin, a whey protein (concentrates, such as WPC and WPI, and separated substances are included), etc. are mentioned. Protein condenses selectively and becomes the organization which did granulative ones, so that the pH is close to an isoelectric point (pH 4.6), when adding an acid raw material, and it mixes from the time of combination or adds at a stretch at a heat melting process. HM pectin is used as stabilizer, and an organization is improvable if it uniforms with emulsion machines, such as a homogenizer, an inline mixer, and a colloid mill, after heat melting.

[0018] As an emulsifier, lecithin, a glycerine fatty acid ester, a sorbitan fatty acid ester, propylene glycol fatty acid ester, sucrose fatty acid ester, etc. are pointed out. Lecithin of marketing usual [, such as a soybean lecithin,] as lecithin, fractionated lecithin (phosphatidylinositol) (PI), Suitably, it is independent, or phosphatidylethanolamine (PE), the lecithin (example-C quantity content lecithin) into

which usual lecithin changed the quantitative ratio of phosphatidylcholine (PC), various refining lecithin, yolk lecithin, etc. combine, and are used. Refining lecithin reforms the usual soybean lecithin etc. by chemical preparation or enzymatic processing, strengthens O/W type emulsifiability, and one sort of hydrogenation lecithin, partial hydrolysis lecithin, acetylation lecithin, and hydroxylation lecithin or two sorts or more are used preferably. As a glycerine fatty acid ester, there are monoglyceride, diglyceride, polyglycerol fatty acid ester, organic acid monoglyceride, etc.

[0019]What is necessary is for what is necessary to be just to carry out with a conventional method, and to carry out heat melting of each raw material, and just to emulsify it except using the above-mentioned raw material, in order to manufacture cream cheese Mr. foodstuffs according to this invention. As a device which carries out heat melting of the raw material, and emulsifies it in this invention, a kettle type cheese-head emulsification iron pot, a horizontal-type cooker, a high-speed shear emulsification iron pot, continuous system heat exchange mechanisms (a shocking SUTERI riser, pair NETA, etc.), etc. can use all. Emulsion machines, such as melting equipment, a homogenizer, an inline mixer, and a colloid mill, are also combinable.

[0020]When an acid raw material is mixed from the time of combination or it added at a stretch at the heat melting process, it mentioned above protein condensing selectively and becoming the organization which did granulative one. Other raw materials become uniform, fused salt demonstrates an effect, casein solubilizes, and partial condensation can be prevented, if an acid raw material is added when a fat emulsifies. In this case, stirring a material mix at a fixed speed, if an acid raw material is added gradually, it is still better. Although the adding speed of the acid raw material which protein does not condense selectively is influenced by agitating speed, it is desirable for the lowering speed of pH to become quick below at a pH 0.07/second. 0.7 to 1.2% of salt is contained in commercial cream cheese. It is preferred to add salt according to the flavor of commercial cream cheese. Hereafter, the example of this invention is described.

[0021]

[Work example 1]Milk protein quantity content powder which condensed skim milk at the process of including UF concentration, and did not carry out pH adjustment in process, but carried out spray drying eventually (83% of a protein content) As 3% of milk sugar content [7 kg of], 17 kg of rapeseed hydrogenated oil with a melting point of 33 **, and fused salt, 0.5 kg of sodium tripolyphosphate, Additive water was put into the high-speed shear emulsification iron pot so that 0.5 kg of cream cheese flavors, 0.5 kg of salt, and after-melting product moisture might be 50%, and heat melting was carried out to 60 ** at 2000 rpm (pH 6.3). 1 kg of 50% of citrate solution was added after that, stirring heating was carried out to 82 **, it uniformed with the inline mixer, and 200g a block of shape was filled up (50% of final water content). The cooled products were a good acid taste similar to cream cheese, and mouthfeel.

[0022]

[Work example 2]As 7 kg of milk protein quantity content powder of Example 1 and 17 kg of rapeseed hydrogenated oil, and fused salt, 0.3 kg of sodium acid citrate, 0.3 kg of disodium hydrogenphosphate, 0.5 kg of cream cheese flavors, 0.4 kg of salt, 0.2 kg of locust bean gum, and additive water were put into the high-speed shear emulsification iron pot, and heat melting was carried out to 85 ** at 2000 rpm (pH 6.3). 0.6 kg of 50% of lactic acid solution and 8 kg of yogurt were added and stirred after that, and it adjusted to 52% of moisture, and uniformed with the inline mixer, and 200g a block of shape was filled up (pH 4.9). The cooled products were a good acid taste similar to cream cheese, and mouthfeel.

[0023]

[Work example 3]6 kg of milk protein quantity content powder of Example 1, 17 kg of soybean hydrogenated oil with a melting point of 32 **, As fused salt, 0.2 kg of sodium pyrophosphate, and 0.2 kg of hexametaphosphoric acid sodium, Additive water was put into the kettle type cheese-head emulsification iron pot so that 0.1 kg of HM pectin, 0.1 kg of guar gum, 0.5 kg of cream cheese flavors, 0.3 kg of salt, and after-melting product moisture might be 51% as stabilizer, and heat melting was carried out to 88 ** at 150 rpm (pH 6.3). 3 kg of cream cheese and 0.7 kg of 50% of lactic acid solution were added (pH 5.1), stirring after that, after carrying out stirring mixing, it uniformed with the

homogenizer, and 200g a block of shape was filled up (51% of final water content). The product after cooling was the good flavor off flavor which is not, and was quality good mouthfeel at moderate softness and sufficiently good as a cream cheese substitute.

[0024]

[Work example 4]6 kg of milk protein quantity content powder of Example 1, 17 kg of soybean hydrogenated oil with a melting point of 32 **, As fused salt, 0.3 kg of sodium acid citrate, and 0.3 kg of hexametaphosphoric acid sodium, Additive water was put into the kettle type cheese-head emulsification iron pot so that 0.1 kg of HM pectin, 0.1 kg of xanthan gum, 0.5 kg of cream cheese flavors, 0.3 kg of salt, and after-melting product moisture might be 47% as stabilizer, and heat melting was carried out to 88 ** at 150 rpm (pH 6.3). 7 kg of yogurt and 0.3 kg of lactic acid were added over 30 seconds (pH5.0:pH0.04/second fall), stirring after that, after carrying out stirring mixing, it uniformed with the homogenizer, and 200g a block of shape was filled up (53% of final water content). It was the good flavor off flavor which is not, and the product of mouthfeel after cooling was good at moderate softness, and was quality enough accepted as a cream cheese substitute.

[0025]

[Effect of the Invention]In this invention, in manufacture of cream cheese Mr. foodstuffs, stabilizer and an emulsifier are suitably added by using protein as the main raw material the milk protein quantity content powder which condensed skim milk at the process of including UF concentration, and carried out spray drying eventually, animal-and-vegetable-oils fat and a melting agent, and if needed, and an acid raw material adjusts pH to 4.0-5.2.

Therefore, a product with good flavor and mouthfeel becomes producible at the simplified process.

[0026]Therefore, according to this invention, it becomes possible to manufacture cheaply the imitation cream cheese which was excellent in flavor, quality, and mouthfeel. Of course, it is also possible to fabricate in various kinds of shape, such as a slice, a stick, and a block, and a size.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the foodstuffs themselves manufactured by the method of manufacturing the cream cheese Mr. foodstuffs which were excellent in flavor and an organization without using a cheese head as the main raw material, and this method.

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PRIOR ART

[Description of the Prior Art] In the manufacture of cheese-head Mr. foodstuffs (imitation cheese heads) which is not used as the main raw material, conventionally a cheese head as a proteinic supply source, Various casein, such as various caseinate, such as sodium caseinate and calcium caseinate, acid casein, and rennet casein, soybean protein, etc. are used. Cholesterol reduction by combining cheese-head Mr. foodstuffs with a low price and vegetable oil and fat, etc. are made into a merit, and a process cheese type, a cream cheese type, a mozzarella cheese type, etc. are actually marketed. However, when various caseinate and various casein are used and gluey flavour uses soybean protein, in order that soybean flavor may carry out, Although it is carrying out odor-masking by flavors, such as a cheese-head flavor, the actual condition is that cannot finish hiding off-flavor and demand is limited.

[0003] On the other hand about imitation cream cheese, A cream cheese constituent is made from casein as a protein source or caseinate, animal-and-vegetable-oils fat, water and some stabilizer, and an emulsifier, a flavor, the method of adding acid, and the same cream cheese constituent are made, and the method of making it ferment, heating and sterilizing this and manufacturing it, etc. are exhibited. However, in the case of the former, gluey flavour of casein or caseinate origin remains, and it cannot be said as a product with good flavor. In the case of the latter, odor-masking [of the off-flavor of a protein raw material] is carried out by a fermentation process, and gluey flavour does not remain in a product. However, as for the fermentation process which starts in preparation of a starter being required although a whey partition process is skipped, it is the actual condition which cannot say easily the process simplified enough.

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EFFECT OF THE INVENTION

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Therefore, a product with good flavor and mouthfeel becomes producible at the simplified process.

[0026] Therefore, according to this invention, it becomes possible to manufacture cheaply the imitation cream cheese which was excellent in flavor, quality, and mouthfeel. Of course, it is also possible to fabricate in various kinds of shape, such as a slice, a stick, and a block, and a size.

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TECHNICAL PROBLEM

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MEANS

[Means for Solving the Problem] This invention was made to achieve the above objects, from every direction, as a result of examination, it was revealed with change of pH at the time of preparing them, and gluey flavour of various caseinate and various casein noted a point further amplified by saving.

[0006] If it carries out deodorization treatment with activated carbon columns etc. once using solution in using these caseinate and casein for nature content products of low protein, such as a drink, it is possible once to use it. However, like a cheese head, in a high-protein case, since it is a semisolid-like, deodorization treatment cannot be carried out.

[0007] Then, ultrafiltration technique which has progressed in recent years as a result of inquiring wholeheartedly from every direction

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(21)出願番号	特願平7-350812	(71)出願人 000006138 明治乳業株式会社 東京都中央区京橋2丁目3番6号
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(54)【発明の名称】 クリームチーズ様食品及びその製造法

(57)【要約】

【解決手段】 脱脂乳をUF濃縮を含む工程で濃縮し、製造過程で、酸やアルカリによりpHを1.0以上変化させないで、最終的に噴霧乾燥した乳蛋白質含有量6.0%以上、乳糖含有量2.5%以下の乳蛋白質高含有粉末、動物油脂及び/又は植物油脂、溶融塩を使用し、酸性原料を添加し、加热溶融し、冷却後の製品のpHを4.0~5.2にすることによりクリームチーズ様食品を製造する。

【効果】 gluey flavour等、オフ・フレーバーが無く、風味、組織の良好なクリームチーズ様食品(イミテーションクリームチーズ)が製造できる。

(2)

特開平9-172965

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【特許請求の範囲】

【請求項 1】 脱脂乳を、限外滤過滤液（UF 滤液）を含む工程で凍結し、製造過程で、酸及び／又はアルカリによって pH を 1.0 以上変化させないで、最終的に噴霧乾燥してなる、乳糖含量の少ない乳蛋白質高含有粉末、動物油脂及び／又は植物油脂、溶融塩を使用し、酸性原料を添加し、加熱溶解し、冷却後の製品の pH を少なくとも 5.2 以下にすること、を特徴とするクリームチーズ様食品の製造方法。

【請求項 2】 乳蛋白質含量が 6.0% 以上、乳糖含量が 2.5% 以下の乳蛋白質高含有粉末を使用すること、を特徴とする請求項 1 に記載の製造法。

【請求項 3】 少なくとも pH 5.2 以下にするための酸性原料は、他原料が混溶溶解され、乳化された後に添加すること、を特徴とする請求項 1 又は請求項 2 に記載のクリームチーズ様食品の製造法。

【請求項 4】 酸性原料として、乳酸菌発酵物、及び／又は有機酸、及び／又は無機酸を使用すること、を特徴とする請求項 1 ～請求項 3 のいずれか 1 項に記載の製造法。

【請求項 5】 乳酸菌発酵物がヨーグルトであること、を特徴とする請求項 4 に記載の製造法。

【請求項 6】 更に、安定剤として少なくとも HMPA ベクチンを使用し、溶融後均質化すること、を特徴とする請求項 1 ～請求項 5 のいずれか 1 項に記載の製造法。

【請求項 7】 少なくとも pH 5.2 以下にするための酸性原料の添加が、pH の低下速度が遠くとも pH 0.07/秒以下になるように行われること、を特徴とする請求項 1 ～請求項 6 のいずれか 1 項に記載の製造法。

【請求項 8】 請求項 1 ～請求項 7 のいずれか 1 項に記載の製造法によって製造してなるクリームチーズ様食品。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、チーズを主原料としないで、風味及び組織のすぐれたクリームチーズ様食品を製造する方法、及び、該方法によって製造してなる食品自体に関する。

【0002】

【従来の技術】従来、チーズを主原料としないチーズ様食品類（イミテーションチーズ類）の製造において、蛋白質の供給源としては、ナトリウムカゼイネート、カルシウムカゼイネート等の各種カゼイネート、酸カゼイン、レンネットカゼイン等の各種カゼイン、及び大豆蛋白質等が利用されている。チーズ様食品は、低価格、植物油脂と組み合わせることによるコレステロール低減、などがメリットとされてプロセスチーズタイプ、クリームチーズタイプ、モッツarellaチーズタイプ等が実際に市販されている。しかしながら、各種カゼイネート、各種カゼインを使用した場合には *bluey flavor*

r が、大豆蛋白質を使用した場合には大豆臭がするため、チーズフレーバー等のフレーバーで矯臭しているものの、オフ・フレーバーが隠しきれず需要が限定されているのが現状である。

【0003】一方、イミテーションクリームチーズに関しては、蛋白質源としてのカゼイン、またはカゼイネート、動物油脂、水及び若干の安定剤、乳化剤でクリームチーズ組成物を作り、フレーバー、酸を添加する方法、また同様のクリームチーズ組成物を作り、これを発酵させ、加熱、殺菌して製造する方法等が公開されている。しかし、前者の場合は、カゼイン、またはカゼイネート由来の *bluey flavor* が残り、風味良好な製品とはいえない。後者の場合は、発酵過程で蛋白質原料のオフ・フレーバーが矯臭され、製品に *bluey flavor* は残らない。しかしながらホエー分離工程が省略されるものの、スターターの調製に始まる発酵工程が必要であることは、十分簡略化された工程とはいえないのが現状である。

【0004】

【発明が解決しようとする課題】本発明は、上記のように、クリームチーズ様食品（イミテーションクリームチーズ）に対する需要が、特に低価格や低コレステロール性の面から、増大している現状に鑑みてなされたものであって、本発明は、ナトリウムカゼイネート、カルシウムカゼイネート等の各種カゼイネート、酸カゼイン、レンネットカゼイン等の各種カゼインを使用して調製した場合の *bluey flavor* 等、オフ・フレーバーの無い風味、組織の良好なクリームチーズ様食品（イミテーションクリームチーズ）を提供することを目的とする。また発酵工程、ホエー工程等設備の必要な複雑な工程を省略できるクリームチーズ様食品の製造法の提供を目的とする。

【0005】

【課題を解決するための手段】本発明は、上記目的を達成するためになされたものであって、各方面から検討の結果、各種カゼイネート、各種カゼインの *bluey flavor* は、それらを調製する際の pH の変化に伴って発現し、さらに、保存することによって増幅される点に着目した。

【0006】飲料等低蛋白質含有製品にこれらカゼイネートやカゼインを使用する場合には、一旦水溶液にした後、活性炭カラム等で脱臭処理すれば、使用することが一応可能である。しかしながら、チーズのように高蛋白質の場合は半固体状であるため、脱臭処理をすることはできない。

【0007】そこで各方面から鋭意検討した結果、近年発達してきた限外滤過技術（UF 技術）を利用して、脱脂粉乳の製造工程に UF 处理を組み込むことによって乳糖含量が少なく、pH 移動処理もない乳蛋白質高含有粉末が生産可能となった点に着目し、このようにして調製

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した乳蛋白質高含有粉末を蛋白質原料として使用したところ、オフ・フレーバーのないすぐれたクリームチーズ様食品が調製できることをはじめて発見した。したがって、本発明によってクリームチーズ様食品を調製するために使用する乳蛋白質高含有粉末の調製には、工程中のpHの調整は極力抑えることが必要である。それにもかかわらず、工程中でpHを1.0以上変化させた場合には、*gourmet flavor*が明確に認められた。

【0008】また、UF濃縮を行うことなく、乳(全乳、脱脂乳)を直接噴霧乾燥して得た全脂粉乳、脱脂粉乳を使用しても、良好なクリームチーズ様食品は得られない。その原因追及の結果、直接噴霧乾燥の場合は、蛋白質に対して乳糖が多すぎ、チーズには異質な旨味が付与されること、加熱溶融工程で乳化しないこと、加熱溶融工程で褐変すること、などから、良好なクリームチーズ様食品が得られないとの知見を得た。

【0009】そして、これらの新知見を総合勘索し、更に検討の結果、UF濃縮を工程に組み込んで製造した、乳糖含量が少なく蛋白質含量が多い粉乳がクリームチーズ様食品の主原料として好適であるとの結論に達し、更に脱脂研究を行い、本発明の完成に至ったものである。

【0010】すなわち本発明は、乳糖含量の少ない乳蛋白質高含有粉末を主原料として、クリームチーズ様食品を製造する点を重要なポイントのひとつとするものであって、上述した*gourmet flavor*のない乳蛋白質高含有粉末を使用した場合、ホエーオフ工程はもちろん発酵工程も省略でき、当該乳蛋白質高含有粉末、動植物油脂、溶融塩、酸性原料、食塩、フレーバー、その他必要に応じて安定剤、乳化剤等の原料を、混合、加熱、溶融し、必要に応じて均質化し、充填することにより、クリームチーズ様食品を効率的に製造するものである。

【0011】本発明においては、乳糖含量が少なく蛋白質含量の高い乳蛋白質高含有粉末であれば、すべてのものが使用できるが、乳糖含量は2.5%以下、好ましくは1.0%以下、乳蛋白質含量は6.0%以上、好ましくは7.0%以上のものが良く、また、製造工程においてpHの調整を極力抑えたものが良く、酸やアルカリによってpHを1.0以上変化させることなく製造したものが特に好適である。

【0012】このような乳蛋白質高含有粉末は、脱脂乳をUF濃縮を含む工程で濃縮し、最終的に噴霧乾燥することにより製造することができ、例えば、下記表1に示す工程によって製造することができる。また、市販品も使用することができる。

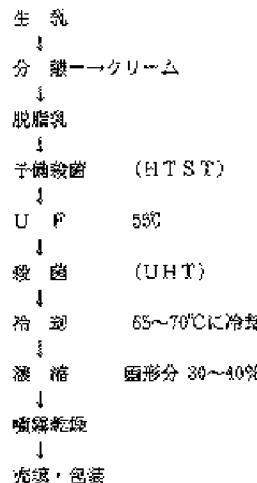
【0013】

【表1】

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UF濃縮粉製造工程

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【0014】しかしながら、このような乳蛋白質高含有粉末を単に使用しただけでは、本発明の所期の目的を達成することはできない。そこで、酸性原料、溶融塩、安定剤、乳化剤等の添加剤の検討、pHの調整等各方面から研究の結果、風味、品質、テクスチャのいづれの面からもすぐれたクリームチーズ様食品の製造にはじめて成功し、本発明の完成に至った。

【0015】本発明においては、酸性原料を添加して、pH 5.2以下、好ましくはpH 4.0~5.2に調整する。酸性原料としては、有機酸、及び/又は無機酸、及び/又は乳酸菌発酵物が使用され、具体例としては、乳酸、クエン酸、アシビン酸、リン酸、酒石酸、コハク酸、フタル酸、リンゴ酸、フィチン酸、グルコン酸(グルコノデルタラクトン)等の酸、ヨーグルト、クリームチーズ、クワルク、カッテージチーズ等の乳酸菌発酵物が挙げられる。酸添加の場合は発酵風味はフレーバーに依存することになるが、乳酸菌発酵物を添加した方がより自然な発酵風味となる。既製の乳酸菌発酵物の中では、pHが低いヨーグルトが良好である。

【0016】更に本発明においては、乳化及びテクスチャ調整のために、溶融塩、安定剤、乳化剤を適宜使用する。本発明において使用する溶融塩の種類、添加量に特に制限はないが、プロセスチーズ製造の常法に従えば添加量は、製品中蛋白質1.0にに対し4~18が目安であり、種類はモノリニン酸塩、ジリニン酸塩、オリリニン酸塩、クエン酸塩、酒石酸塩等のうち単独又は組み合わせて用いられる。

【0017】安定剤としては、澱粉(化工澱粉を含む)、ゼラチン、寒天、ベクチン、ローカストビーンガム、キサンタンガム、グアーガム、アラビアガム、CMC、トラガントガム、タマリンドガム、ファーセレン、卵白アルブミン、ホエー蛋白質(WPC、WP)等濃縮物、分離物を含む)等が挙げられる。酸性原料を添

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加する場合、配合当初より混合する、または加熱溶融工程で一気に添加すると、そのpHが等電点（pH4.6）に近い程、蛋白質が部分的に凝聚し、ザラザラした組織になる。安定剤としてHMベクチンを使用し、加熱溶融後にホモグナイザー、インラインミキサー、コロイドミルなどの乳化機で均質化すれば組織を改良できる。

【0018】乳化剤としてはレシチン、グリセリン脂肪酸エステル、ソルビタン脂肪酸エステル、プロビレングリコール脂肪酸エステル、ショ糖脂肪酸エステル、等を指す。レシチンとしては大豆レシチン等通常の市販のレシチン、分別レシチン（ホスファチジルイノシトール）（P I）、ホスファチジルエタノールアミン（P E）、ホスファチジルコリン（P C）の疊比を通常のレシチンとは変えたレシチン（例：P C高含量レシチン）、植物の改質レシチン、卵黄レシチン等が、適宜、単独で、あるいは組み合わせて用いられる。改質レシチンは通常の大豆レシチン等を化学的処理または酵素的処理により改質してO/W型乳化性を強めたものであって、好ましくは、水素添加レシチン、部分加水分解レシチン、アセチル化レシチン及びヒドロキシル化レシチンの1種又は2種以上が使用される。グリセリン脂肪酸エステルとしては、モノグリセリド、ジグリセリド、ポリグリセリン脂肪酸エステル、有機酸モノグリセリド等がある。

【0019】本発明にしたがってクリームチーズ様食品を製造するには、上記した原料を使用する以外は常法によって行えよく、各原料を加熱溶融し、乳化すればよい。本発明において原料を加熱溶融し、乳化する装置としては、ケトル型チーズ乳化釜、構型クリッカー、高速せん断乳化釜、及び連続式熱交換機（シャックステリライザー、コンビネーターなど）などいずれも使用できる。また、溶融装置とホモグナイザー、インラインミキサー、コロイドミルなどの乳化機を組み合わせることもできる。

【0020】酸性原料を配合当初より混合する、または加熱溶融工程で一気に添加すると、蛋白質が部分的に凝聚し、ザラザラした組織になることは前述した。他原料が均一になり、溶融塩が効果を発揮してカゼインが可溶化し、脂肪が乳化した時点で酸性原料を添加すると部分的凝聚を防ぐことが出来る。この場合原料ミックスを一定の速度で攪拌しながら、酸性原料を徐々に添加するとさらに良好である。蛋白質が部分的に凝聚しない酸性原料の添加速度は、攪拌速度に左右されるが、pHの低下速度が速くともpH0.07/秒以下になるのが望ましい。市販のクリームチーズには0.7~1.2%の食塩が含まれている。市販クリームチーズの風味に合わせて、食塩を添加するのが好ましい。以下、本発明の実施例について述べる。

【0021】

【実施例1】脱脂乳をUF濃縮を含む工程で濃縮し、工程中のpH調整をせず、最終的に瞬間乾燥した乳蛋白質

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高含有粉（蛋白質含有量8.3%、乳糖含有量3%）7kg、融点33°Cのナタネ硬化油17kg、溶融塩としてトリポリリン酸ナトリウム0.5kg、クリームチーズフレーバー0.5kg、食塩0.5kg、溶融後製品水分が5.0%になるよう添加水を高速せん断乳化釜に入れ、2000rpmで60°Cまで加熱溶融した（pH6.3）。その後クエン酸5.0%水溶液を1kg添加し、82°Cまで攪拌加熱し、インラインミキサーで均質化し、200gブロックの形状に充填した（最終水分5.0%）。冷却した製品はクリームチーズに類似した良好な酸味、食感であった。

【0022】

【実施例2】実施例1の乳蛋白質高含有粉7kg及びナタネ硬化油17kg、溶融塩としてクエン酸ナトリウム0.3kg、リン酸水素二ナトリウム0.3kg、クリームチーズフレーバー0.5kg、食塩0.4kg、ローカストビーンガム0.2kg、添加水を高速せん断乳化釜に入れ、2000rpmで85°Cまで加熱溶融した（pH6.3）。その後乳酸5.0%水溶液0.6kg、ヨーグルト8kgを添加し、攪拌し、水分5.2%に調整し、インラインミキサーで均質化し、200gブロックの形状に充填した（pH4.9）。冷却した製品はクリームチーズに類似した良好な酸味、食感であった。

【0023】

【実施例3】実施例1の乳蛋白質高含有粉6kg、融点32°Cの大豆硬化油17kg、溶融塩としてビロリン酸ナトリウム0.2kg及びヘキサメタリン酸ナトリウム0.2kg、安定剤としてHMベクチン0.1kg、グーガム0.1kg、クリームチーズフレーバー0.5kg、食塩0.3kg、溶融後製品水分が5.1%になるよう添加水をケトル型チーズ乳化釜に入れ、150rpmで88°Cまで加熱溶融した（pH6.3）。その後攪拌しながらクリームチーズ3kg及び乳酸5.0%水溶液0.7kgを添加し（pH5.1）、攪拌混合した後ホモグナイザーで均質化し、200gブロックの形状に充填した（最終水分5.1%）。冷却後の製品はオフ・フレーバーのない良好な風味であり、適度な歯らかさで食感も良好であり、クリームチーズ代替物として十分良好な品質であった。

【0024】

【実施例4】実施例1の乳蛋白質高含有粉6kg、融点32°Cの大豆硬化油17kg、溶融塩としてクエン酸ナトリウム0.3kg及びヘキサメタリン酸ナトリウム0.3kg、安定剤としてHMベクチン0.1kg、キサンタンガム0.1kg、クリームチーズフレーバー0.5kg、食塩0.3kg、溶融後製品水分が4.7%になるよう添加水をケトル型チーズ乳化釜に入れ、150rpmで88°Cまで加熱溶融した（pH6.3）。その後攪拌しながらヨーグルト7kg及び乳酸0.3kgを30秒かけて添加し（pH5.0:pH0.04/秒

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低下）、攪拌混合した後ホモゲナイザーで均質化し、200 g ブロックの形状に充填した（最終水分 53%）。冷却後の製品はオフ・フレーバーのない良好な風味であり、適度な歎らかさで食感も良好であり、クリームチーズ代替物として十分通用する品質であった。

【0025】

【発明の効果】本発明によれば、クリームチーズ様食品の製造において、蛋白質を主原料として、脱脂乳を UF 濃縮を含む工程で濃縮し最終的に喷霧乾燥した乳蛋白質

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高含有粉、動植物油脂、及び溶融剤、必要に応じて安定剤、乳化剤を適宜添加し、酸性原料で pH を 4.0 ~ 5.2 に調整することにより、風味、食感とも良好な製品が、簡略化された工程で生産可能となる。

【0026】したがって本発明によれば、風味、品質、食感のすぐれたイミテーションクリームチーズを安価に製造することが可能となる。また、スライス、スティック、ブロック等各種の形状、大きさに成形することももちろん可能である。